Structural Classification

Structural classification is done on the basis of-

1. Based on Nature of Components.
2. Based on Arrangement of the Components.

1. Based on Nature of Components

i. Based on Presence.

ii. Based on Dominance.

i. Based on Presence

a. Agrisilviculture (Crops and trees).

b. Silvopastoral (Pasture/ Animals and trees).

c. Agrosilvopastoral (Crops, Pasture/ animals and trees).

d. Others: Multipurpose tree lots, apiculture with trees, aquaculture with trees etc.

ii. Based on Dominance of Components

On the basis of dominance of components, the systems is further classified into the following categories-

a. Silvoagriculture: Here silvoculture is the primary aim of land use. Trees constitute the major component while agricultural crops are integrated with them. e.g. Shifting cultivation, Taungya cultivation.

b. Agrosilviculture: Agriculture is the primary (major) components and the trees are secondary. e.g. Multipurpose trees on farm land, hedge row or alley cropping, intercropping of trees, home gardens.

c. Silvopasture: Trees constitute the primary (major) component of land use with pastures as secondary. Most grazing in forests can be treated as Silvopasture.

d. Pastoral silviculture: Pasture is a primary component while the trees is secondary. e.g. grazing land.

e. Agrosilvopasture: It is combination of crops, trees and pastures. Both crop and trees are dominant over pasture.

f. Silvoagropasture: It is combination of trees, crops and pastures. Trees are dominant over other components.

2. Based on Arrangement of Components

Arrangement of component can involve the dimension of space and time. Based on the arrangement of components Agroforestry system can be classified as-

- ♣ In Space or spatial arrangement.
- ♣ In time or temporal sequence.
- ♣ Vertical stratification of components.

♣ Classification of Agroforestry systems on the basis of **in space or spatial arrangement:**

a. Mixed dense: Different components are arranged together with high density. e.g. Home garden.

b. Mixed sparse: Different components are arranged together with low density. e.g. Most systems of trees in pastures, Scattered trees on agricultural lands.

c. Strip plantation: Width of strip to be more than one tree. e.g. Alley cropping.

d. Boundary plantation: Trees on edges of plots/ fields.

♣ Classification of Agroforestry systems on the basis of **in time or temporal sequence:**

a. Coincident: It occurs when different crops occupy the land together. e.g. Tea/ Coffee under shade tree, pastures under trees.

b. Concomitant: When different components stay together for certain period. e.g. Taungya system.

c. Intermittent: When annual crops are grown with perennial ones. e.g. Rice under coconut trees or other MPTs, Seasonal grazing of cattle pastures under trees.

d. Interpolated: When different components occupy the space during different times. e.g. Home garden.

e. Overlapping: e.g. Black pepper in rubber.

f. Separate: When components occupy space at different times. e.g. Improved 'fallow' species in shifting cultivation.

♣ Classification Based on **stratification of components:**

a. Single layered: The major component usually grows in one layer or storey. e.g. Tree garden.

b. Double layered: The major component usually grown in two layers. e.g. Tea/ Coffee under shade tree.

c. Multilayered: Different components are grown in different layers. e.g. Homestead agroforestry.

Functional Classification

Production and protection are theoretically, two fundamental attributes of all agroforestry systems. This implies that agroforestry systems have a productive function yielding one or more products that usually meet basic needs, as well as a service role i.e. protective function. On the basis of various functions the agroforestry systems are classified into following:

1. Productive Agroforestry system: This system refers to the production of essential commodities, required to meet the basic needs of the society. It includes inter cropping of trees, home gardens, plantation of trees in and around the crop field, production of animals and fishes in association with trees. Productive functions are as follows-

- ▲ Food.
- ▲ Fodder.
- ▲ Fuel wood.
- ▲ Others woods.
- ▲ Other products.

2. Protective Agroforestry system: This system refers to protect the land, to improve climate, reduce wind and water erosion, improve soil fertility, provide shelter and other benefits. Protective functions are as follows:

1. Wind break.
2. Shelter belt.
3. Soil conservation.
4. Moisture conservation.
5. Soil improvement.
6. Shade (for crop, animals and man).

Socioeconomic Classification

On the basis of socioeconomic consideration the agroforestry system are classified as:

1. Subsistence Agroforestry system: Subsistence Agroforestry system aims at the basic needs of small family having less holding and very little capacity for an investment. There may be some marginal surplus production for sale. e.g. Shifting cultivation, Scattered trees in the farms, Homestead Agroforestry.

2. Commercial Agroforestry system: It refers to large scale production on commercial basis. The main consideration is to sale the products. e.g. Tea/ Coffee under shade tree.

3. Intermediate Agroforestry system: It is an intermediate between commercial and subsistence system. It is practiced on small and medium sized farms. The systems aims at the production of items which are not only enough to meet the needs of the family but also earn money from the surplus can be sold.

The Socioeconomic Agroforestry system may further be classified on the basis of Management and Technology used.

On the basis of Management

i) Intensively managed system: Agroforestry systems are intensively managed for more production per unit area as in home gardens, trees with agricultural crops.

ii) Extensively managed system: It includes Shifting cultivation, Silvopasture, Pastoral silviculture etc.

On the basis of Technology

i) Low technology system: The technology used in this system is primitive as in shifting cultivation.

ii) High technology system: This system depends on the modern technology for production of forest and agricultural crops. e.g. Tissue culture, Biotechnology, Genetic engineering etc.

iii) Intermediate technology system: This system is an intermediate between low and high technology systems. Most of Agroforestry systems belong to this category.

Classification based on Utilization of Land

On the basis of Utilization of land, the Agroforestry production systems are sometimes classified into the following categories-

1. Homestead Agroforestry: Production of fruit trees, selected MPTs having less canopy and decorative trees/ shrubs along with vegetables, spices and many shade loving crops.

2. Forest land Agroforestry: Production of crops in the vacant spaces of the forest.

3. Crop farm forestry: Production of crops and trees in the crop land.

4. Fish farm forestry: Production of fishes and trees in the fish farm.

5. Animal farm forestry: Classified as-

 i. Poultry farm forestry: Farming of poultry birds and trees.

 ii. Dairy farm forestry: Farming of milk cattle and trees.

iii. Beef cattle farm forestry: Farming of beef cattle and trees.

iv. Goat farm forestry: Farming of goats and trees.

v. Integrated farm forestry: Production of crops, animals, fishes along with trees.

vi. Road side Agroforestry: Production of deep rooted tall trees with narrow canopies and soil building grasses or crops along the sides of roads, highways, railways and embankment.

Differentiated between Agroforestry System and Practices

Agroforestry System	Agroforestry Practices
1. Agroforestry system is a specific local example of a practices, characterized by environment, plant species and their arrangement management and socioeconomic functioning.	1. An Agroforestry practices denotes a distinctive arrangement of component in space and time.
2. Agrisilvicultural System	♣ Improved fallow ♣ Taungya ♣ Alley cropping ♣ Multilayer tree gardens ♣ Multipurpose trees on crop land ♣ Plantation crop combinations ♣ Home gardens ♣ Trees in soil conservation and reclamation ♣ Shelter belts and Windbreaks live hedges ♣ Fuel wood production
3. Silvopastoral system	♣ Trees on range land and pastures ♣ Protein banks ♣ Plantations crops with pastures and animals
4. Agrosilvopastoral system	♣ Home gardens involving animals ♣ Multipurpose woody hedgerows ♣ Apiculture will trees ♣ Aquaforestry ♣ Multipurpose wood lots

Different Types of forest in Bangladesh

Ans: See the book of "Basic Agriculture, PART-II, Page no- 222".

State the types of Mangrove forest in Bangladesh

Ans: See the book of "Basic Agriculture, PART-II, Page no- 223".

Ecological Classification

The Agroforestry system is related to various ecological factors. It can be classified on the basis of important ecological parameters (Climate, edaphic and physiographic ones).

♣ On the basis of **Ecological parameters**, it can be classified as-

1) Tropical: Vegetation in extreme climate, such as high temperature, low humidity and scarcity of water etc. e.g. Tropical Silvopasture.

2) Sub-tropical: Vegetation in suitable climatic condition. e.g. Agroforestry practices in the sub-tropical regions including Bangladesh.

3) Temperate: Vegetation in low temperature. e.g. Silvopasture or pastoral silviculture in temperate region.

4) Sub-alpine: Vegetation in low and medium mountainous regions. e.g. Natural or artificial forest vegetation in low or medium mountains.

5) Alpine: Vegetation in high mountainous regions. e.g. Natural forest vegetation in high altitude.

♣ Each of these group can further be sub-divided on the basis of **Moisture condition** into the following types-

1) Wet: Vegetation under high moisture content of the growing areas as in marshy land, Swamp, waterlogged area.

2) Moist: Vegetation under adequate moisture status of the following place as the crop fields with Agrosilviculture, Silvoagriculture.

3) Dry: Vegetation under very low moisture as in tropical dry forest.